

Title (en)
Variable length steering shaft

Title (de)
Lenkwelle mit verstellbarer Länge

Title (fr)
Arbre de direction de longueur variable

Publication
EP 0699574 A3 19961120 (EN)

Application
EP 95200353 A 19950214

Priority
US 21209194 A 19940314

Abstract (en)
[origin: US5417614A] A variable length shaft assembly suitable for motor vehicle steering systems including a tubular outer shaft of non-circular cross section and a solid inner shaft of corresponding non-circular cross section telescoped inside of the outer shaft. A U-shaped metal spring is disposed over the solid shaft adjacent an outboard end of the tubular shaft with opposite legs of the spring in sliding engagement on corresponding flat sides of the solid shaft. A monolithic plastic sleeve is in situ molded on the tubular shaft and includes an integral lip closely surrounding the solid shaft. The integral lip captures the relative angular positions of the shafts about a longitudinal centerline of the assembly, i.e. delashes the shafts, defines a slide bearing between the shafts, and rigidly encases the spring. The surfaces of the legs of the spring which bear against the solid shaft are exposed after the sleeve is in situ molded and define wear plates on the integral plastic lip which protect the lip against abrasion.

IPC 1-7
B62D 1/18

IPC 8 full level
B62D 1/18 (2006.01); **B62D 1/19** (2006.01); **F16C 3/03** (2006.01); **F16D 3/06** (2006.01)

CPC (source: EP US)
B62D 1/192 (2013.01 - EP US); **F16C 3/03** (2013.01 - EP US); **F16C 29/02** (2013.01 - EP US); **F16D 3/06** (2013.01 - EP US); **F16C 2326/24** (2013.01 - EP US)

Citation (search report)
• [A] FR 2561605 A1 19850927 - NACAM [FR]
• [A] US 4911034 A 19900327 - KULCZYK DAVID [US], et al
• [A] US 3046759 A 19620731 - DEFORD DONALD E, et al
• [A] DE 1776263 U 19581023 - CONTINENTAL GUMMI WERKE AG [DE]

Cited by
CN109263027A; CN1102515C; CN107725573A; US7832936B2

Designated contracting state (EPC)
DE FR GB

DOCDB simple family (publication)
US 5417614 A 19950523; AU 661635 B1 19950727; BR 9501045 A 19951024; EP 0699574 A2 19960306; EP 0699574 A3 19961120; JP H07257398 A 19951009

DOCDB simple family (application)
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